Trestle Forest Health Project - Draft Alternatives, Including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the **Trestle Forest Health Project**. It describes both alternatives considered in detail and those eliminated from detailed study. The end of this chapter presents the alternatives in tabular format so that the alternatives and their environmental impacts could be readily compared.

Alternatives Considered in Detail

Based on the issues identified through public comment on the proposed action, the Forest Service developed two alternative proposals that achieve the purpose and need differently than the proposed action. In addition, the Forest Service is required to analyze a No Action alternative. The proposed action, alternatives and no action alternative are described in detail below.

Alternative 1

No Action - Under the No Action alternative, current management plans would continue to guide management of the project area. No commercial thinning, prescribed burning, watershed restoration activities, or other activities would be implemented to accomplish the purpose and need. This alternative provides for the comparison of the effects of "No Action" against the magnitude of the environmental effects of the action alternatives.

Alternative 2

Proposed Action- This Alternative emphasizes reducing fire and fuel hazards and improving forest health through fuel manipulation. Treatments and management actions would include the following:

1. Conduct prescribed understory burning on approximately 16,581 acres. Activities would include construction of firelines by hand or tractor, and hand cutting ladder fuels (trees less than 8.9 inches d.b.h.) around large old growth conifers, and oak trees. This activity would also occur in non-commercial plantations that are not proposed for pre-commercial thinning. Fire line construction would follow established guidelines for waterbar construction as outlined in the Best Management Practices. Upon completion of prescribed burning activities, the visible character of the firelines would be hidden by spreading woody debris where they intersect existing roads and trails to limit unauthorized vehicle use.
2. Hand cut understory vegetation (trees less than 8.9 inches d.b.h.), pile and burn the piles approximately 1,047 acres within 500 feet of private property boundaries in the Wildland Urban

Interface (WUI) defense zones and threat zones. Cut understory vegetation (trees less than 8.9 inches d.b.h.), pile and burn on 446 acres within the Steely Fork Cosumnes River drainage south of the community of Grizzly Flat. Hand treatments would still occur if mechanical treatment units are dropped from implementation.

3. Conduct mechanical thinning (trees less than 12 inches d.b.h.) within 100 feet on both sides of the Capps Crossing Road (9N30).
4. Within the project area, conduct danger tree removal adjacent to system roads and motorized trails open to the public, including landings, dispersed camping areas, and within treatment units, for public, woods workers, and Forest Service employee safety. Dead and unstable live trees that do not present a hazard would be retained.
5. Maintain and recruit snags (trees greater than16 inches d.b.h.) and down logs (16 inches in diameter and 10 feet long) by leaving pre-existing individual snags and logs. Tree killed by prescribed understory burning activities, unless they pose a danger to the public, woods workers, and Forest Service employees would also be left standing or felled to create down logs.
6. Evaluate qualifying cultural resources located within the project area using the California Archaeological Resource Identification and Data Acquisition Program, as adapted for north-central Sierra Nevada Forests, to determine eligibility for inclusion on the National Register of Historic Places.
7. Enhance and maintain montane hardwood ecosystems dominated by California black oak, canyon live oak by removing competing conifers (less than 29.9 inches d.b.h.) from the understory and within 30 feet of the perimeter of existing oak trees and/or groups of oaks.
8. Enhance and restore watershed conditions by physically closing approximately 53 miles of system roads and 4 miles of motorized trails previously determined to not be open to the public in accordance with the TMP-ROD. Closure would be accomplished by employing earth barricades or gates. Roads would continue to be used by the Forest Service for future recurrent management of the area, such as, administrative traffic for prescribed burning.
9. Enhance and restore watershed conditions by physically obliterating approximately 5 miles of non-system roads and trails previously determined to not be open in accordance with the TMP-ROD. Obliteration would include: earth barricades; ripped to alleviate soil compaction and restore infiltration; seeding, removing drainage structures; slashing; and, camouflaging road junctions.
10. Use a combination of ground based and skyline logging systems to conduct commercial thinning (10-29.9 inches d.b.h.) on approximately 4,958 acres (257 acres of skyline in natural stand. 4,701 acres of ground based in natural stands. Approximately 27,192 MBF of sawtimber would be removed. Ground-based mechanized equipment (low-impact feller-buncher, hand felling, and conventional skidding equipment) would be restricted to slopes generally less than 35%. Where necessary during initial harvest, small trees and brush (4-9.9 inches d.b.h.) would be mechanically thinned to facilitate sawtimber and biomass removal on approximately 2,664 acres in selected natural stands. Skyline would be restricted to slopes greater than 35%. (Map#)

11. Conduct pre-commercial thinning (trees less than 10 inches d.b.h.) on 66 acres of conifer plantations, of which, 19 acres located in California spotted owl Protected Activity Centers (PACs).
12. Restore watershed conditions, facilitate treatment activities, and repair erosion problems, by reconstruction of approximately 79 miles of system roads and maintenance of 30 miles of system roads. Reconstruction and maintenance activities would include: repair or replacement inadequate drainage culverts; elimination of ruts; roadside drainage maintenance; cattleguard cleaning and repair; installation of waterbars and dips with inadequate water runoff control; placement of erosion resistant and protective material (riprap), gate installation to control seasonal use or replacement of existing non-functional gates or barricades; cleaning and filling cracks and potholes on existing asphalt roads; and, cutting and removing roadside vegetation encroaching on all system roads.
13. To furnish an adequate water supply for fire or contract work, perform maintenance and repair work on ten existing water supply facilities. Maintenance and repair work would include: clearing plugged pipes; installing temporary weirs or sandbags; placing erosion resistant and protective material (riprap) on road surfaces accessing water supply facilities; and, cleaning pond areas of debris.
14. Perform machine piling, and cutting small trees and brush (trees 1-3.9 inches d.b.h.) with follow-up pile burning on approximately 2,503 acres in natural stands to reduce ground fuels and ladder fuels. Machine piling would not occur on slopes greater than 35%.
15. Reuse about 3 miles of existing temporary roads. After roads have served their contractual use, roads would be obliterated using the following: earth barricades; ripped to alleviate soil compaction and restore infiltration; seeding, removing drainage structures; slashing; and, camouflaging road junction.
16. Remove approximately 74,370 tons of biomass from treatment units. Biomass and logging debris accumulated on landings would be disposed of or removed in a number of ways, including on-site burning, commercial and/or personal firewood, or co-generation fuel.
17. Remove approximately 26 miles of barbed wire fencing, primarily from the vacant Caldor and Steely Creek Range Allotments to: eliminate wildlife movement barriers, particularly for large game species; eliminate wildlife entanglement; and, remove barriers and improve safety for human access for recreational use, fire suppression, and management activities. Materials that could be salvaged would be incorporated into future projects on the Forest and the remainder would be recycled.
18. Prescribed fire and hand thinning would be used to improve habitat quality for Pleasant Valley Mariposa lily populations that have been impacted by growth of competing vegetation.
19. Boulders would be located in positions to protect the Pleasant Valley Mariposa lily occurrence along Big Mountain Road from vehicle traffic.
20. Rehabilitate dispersed camping areas and associated spur roads adjacent to Dogtown Creek and the Steely Fork Consumnes River. The twenty-six (26) sites requiring rehabilitation activities

would be specific to each location in order to best reduce the erosion of sediment from the camping areas into the adjacent to creeks and streams. Activities would include: placement of boulders to define the boundary of camping areas and block unnecessary non-system roads; ripping compacted areas and spur roads to alleviate soil compaction and restore infiltration; installation of waterbars and dips with inadequate water runoff control; placement of organic material on the ground surface of denuded areas; seeding and/or planting native vegetation; and, camouflaging unwanted road junctions. Selected sites would be included with the road reconstruction and maintenance activities.

Alternative 3

This alternative provides for reducing fire hazards through fuels reduction to meet minimal fuels objectives. No skyline logging would occur, in addition to a reduction of road reconstruction work. This alternative would include the following treatments and management actions:

1. Prescribed understory burning on approximately 16,581 acres.
2. Hand cut (trees less than 8.9 inches d.b.h.), pile and burn the piles approximately 1,047 acres within 500 feet of private property boundaries.
3. Hand cut (trees less than 8.9 inches d.b.h.), pile and burn on 446 acres.
4. Mechanical thinning (trees less than 12 inches d.b.h.) within 100 feet on both sides of the Capps Crossing Road (9N30).
5. Danger tree removal adjacent to system roads and motorized trails open to the public, including landings, dispersed camping areas, and within treatment units, for public, woods workers, and Forest Service employee safety.
6. Maintain and recruit snags (trees greater than16 inches d.b.h.) and down logs (16 inches in diameter and 10 feet long) by leaving pre-existing individual snags and logs.
7. Evaluate qualifying cultural resources located within the project area using the California Archaeological Resource Identification and Data Acquisition Program, as adapted for north-central Sierra Nevada Forests, to determine eligibility for inclusion on the National Register of Historic Places.
8. Removing competing conifers (less than 12 inches d.b.h.) from the understory and within 30 feet of the perimeter of existing oak trees and/or groups of oaks.
9. Closing approximately 53 miles of system roads and 4 miles of motorized trails.
10. Obliterating approximately 5 miles of non-system roads and trails.

11. Pre-commercial thinning (4-12 inches d.b.h.) on approximately 4,701 acres (4,196 acres of natural stands and 505 acres of plantations. It is expected that a nominal of amount of commercial sawtimber would be removed to facilitate equipment access to treat the units effectively and for landings and skid trails. Approximately 2,351 MBF of sawtimber would be removed from slopes generally less than 35%.
12. Conduct pre-commercial thinning on 66 acres of conifer plantations.
13. Perform road maintenance on approximately 30 miles of system roads.
14. Perform maintenance and repair work on existing water supply facilities.
15. Remove approximately 70,515 tons of biomass from treatment units.
16. Remove approximately 26 miles of barbed wire fencing.
17. Prescribed fire and hand thinning would be used to improve habitat quality for Pleasant Valley Mariposa lily populations.
18. Boulders would be located in positions to protect the Pleasant Valley Mariposa lily occurrence along Big Mountain Road from vehicle traffic.
19. Rehabilitate dispersed camping areas and associated spur roads adjacent to Dogtown Creek and the Steely Fork Consumnes River.

Alternative 4

This alternative was developed based on comments that given the reported population decline in the area, thinning of California spotted owl and great grey owl habitats could lead to negative effects to owl populations in the project area. This alternative would commercially thin 4,038 acres less than the Alternative 2, no skyline thinning, and 32 miles less of road reconstruction. This alternative would include the following treatments and management actions:

1. Conduct prescribed understory burning on approximately 16,581 acres.
2. Hand cut understory vegetation (trees less than 8.9 inches d.b.h.), pile and burn the piles approximately 1,047 acres within 500 feet of private property boundaries in the Wildland Urban Interface (WUI) defense zones and threat zones. Cut understory vegetation (trees less than 8.9 inches d.b.h.), pile and burn on 446 acres within the Steely Fork Cosumnes River drainage south of the community of Grizzly Flat.
3. Conduct mechanical thinning (trees less than 12 inches d.b.h.) within 100 feet on both sides of the Capps Crossing Road (9N30).
4. Conduct danger tree removal adjacent to system roads and motorized trails open to the public, including landings, dispersed camping areas, and within treatment units.
5. Maintain and recruit snags (trees greater than16 inches d.b.h.) and down logs (16 inches in diameter and 10 feet long) by leaving pre-existing individual snags and logs.
6. Evaluate qualifying cultural resources located within the project area using the California Archaeological Resource Identification and Data Acquisition Program, as adapted for north-

central Sierra Nevada Forests, to determine eligibility for inclusion on the National Register of Historic Places.

7. Removing competing conifers (less than 12 inches d.b.h.) from the understory and within 30 feet of the perimeter of existing oak trees and/or groups of oaks in treatment units.
8. Physically closing approximately 53 miles of system roads and 4 miles of motorized trails.
9. Obliterating approximately 5 miles of non-system roads and trails.
10. Conduct commercial thinning (10-29.9 inches d.b.h.) on approximately 920 acres. Approximately 7,130 MBF of sawtimber would be removed.
11. Conduct pre-commercial thinning (4-12 inches d.b.h.) on 3,715` acres. It is expected a nominal of amount of commercial sawtimber would be removed to facilitate equipment access to treat the units effectively and for landings and skid trails. Approximately 9,300 MBF of sawtimber would be removed.
12. Pre-commercial thinning (trees less than 12 inches d.b.h.) on 66 acres of conifer plantations.
13. Conduct road maintenance on approximately 47 miles of system roads.
14. To furnish an adequate water supply for fire or contract work, perform maintenance and repair work on existing water supply facilities.
15. Perform machine piling, and cutting small trees and brush (trees 1-3.9 inches d.b.h.) with follow-up pile burning on approximately 477 acres.
16. Remove approximately 69,500 tons of biomass from treatment units
17. Remove approximately 26 miles of barbed wire fencing
18. Prescribed fire and hand thinning would be used to improve habitat quality for Pleasant Valley Mariposa lily populations.
19. Boulders would be located in positions to protect the Pleasant Valley Mariposa lily occurrence along Big Mountain Road from vehicle traffic.
20. Rehabilitate dispersed camping areas and associated spur roads adjacent to Dogtown Creek and the Steely Fork Consumnes River.

Design Criteria Common to All Action Alternatives

The Forest Service also developed the following design criteria to be used for all action alternatives, including the proposed action. The purpose of design criteria is to avoid, minimize, compensate, reduce or eliminate potential negative effects of the proposed activities to cultural, physical, and biological resources in the project area. All relevant design criteria would be included in all projects initiates under authority of this Environmental Impact Statement.

Vegetation and Harvest Practices

Activities would be conducted so as to protect water quality by using BMPs, employed by the Forest Service and the State of California to prevent water quality degradation and to meet State Water Quality Objectives relating to non-point sources of pollution. In addition, the Forest Service would use site-specific mitigation measures that relate directly to these BMPs to minimize erosion and resultant sedimentation.

Silviculture prescriptions would comply with LRMP, SNFPA, laws, policies, and regulations. Prescriptions would apply concepts described in GTR-220 and GTR-237.

Rust-resistant sugar pine trees would be identified and protected from all activities.

One-end suspension of all material (whole trees, bundles, and sawlogs) would occur during skidding operations to reduce ground disturbance.

Re-use existing skid trails and landings where possible.

Dust abatement would be used to mitigate the increase in fugitive dust.

To minimize effects to water quality from landing disturbing activities, landings would: not exceed the size needed for safe and efficient skidding and loading operations; locations of landings would be selected which involves the least amount of excavation and erosion potential, and to minimize impacts to other resources.

Skid trail and skyline corridor layout would be agreed to in advance by the Timber Sale Administrator and Purchaser.

Machine piling would be precluded on slopes greater than approximately 35% and from sensitive areas, such as archaeological sites, sensitive plant areas, and perennial stream courses buffer zones or inner-gorge areas.

Hardwoods greater than 4 inches d.b.h. would be retained except where removal is needed for equipment operability.

Divots greater than 2 feet in depth caused by mechanical harvesting equipment would be re-contoured where it has a potential to channel water.

Treatment units identified for skyline yarding would include use of mechanical equipment to cut and bunch thinned trees on slopes generally less than 50%. Hand felling trees would be used in areas with slopes generally steeper than 50%.

Berms caused by cable yarding operations would be re-contoured. Some slash would be retained on skyline corridors following operations.

The actual number of road reconstruction miles proposed would be determined by the economics of the stewardship timber sale contract at the time of sell date. If the log values are up then more dollars/mile could be allocated to be reconstructed and if the log values are down then reconstruction miles would be proportionally less.

Existing waterholes and other sites such as ponds, lakes, or streams, used for water drafting would be inspected for existing amphibians and flow levels prior to use. Maximum drawdown volumes would be estimated prior to using draft sites. Minimum pool levels during drafting would be maintained. Drafting sites would be constructed so that oil, diesel fuel, or other spilled pollutants would not enter the stream. Stream bank stability would be maintained and sedimentation minimized by constructing and maintaining back down ramps using rocking, chipping, mulching, or other effective method. A Forest Service approved screen covered drafting box, or other device to create a low entry velocity, would be used while

drafting to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats.

Designated system roads and trails would be protected during project activities to maintain use and access by the public and Forest Service.

In addition to the seasonal closure identified by the Wheeled Motorized Travel Management Final Environmental Impact Statement (FEIS) (2008) roads identified as open for public use may be temporarily closed during inclement weather to protect reconstruction investments until those roads have stabilized. A Forest Order would be issued.

Machine piles would be placed at least 50 feet from property boundary lines to reduce risk of fire escape and facilitate burning. Piles would be placed away from the boles of residual trees to reduce damage to residual trees and snags. Where pile burning results in mortality in excess of Forest Plan standards, salvaging dead and dying trees would occur to allow for minimizing landing size operations. Hand piles would be placed outside of prescribed fire ignition exclusion zones or a minimum of 25 feet from any stream channel, whichever is greater.

During harvest operations, the Timber Sale Administrator would designate randomly distributed pockets of small trees, understory brush that would be retained to provide terrestrial wildlife habitat.

Protect Grizzly Flats Community Services District diversion dams and drafting stations from treatment activities.

Prescribed Fire

All burning activities would adhere to pertinent air quality regulations. Smoke emissions would be minimized by following Best Available Control Measures (BACM). A smoke permit administered by the local County Air Resource Agency would accompany burn plans. For this project the Eldorado County Air Pollution Control District would issue the permit. To reduce effects of prescribed burns on air quality, smoke control and monitoring measures would be identified in the Smoke Management Plan that would be prepared prior to burning. The Smoke Management Plan would identify potential smoke impacts on Class 1 airsheds and populated communities/areas that may be impacted. Desired and acceptable wind directions for smoke travel, and mitigation strategies would be included in the smoke management plan. The Forest Service would contact the county prior to burning to notify the planned amount of acres to burn on a given day as well as the burn location. Burning would be conducted on the basis of whether the county grants or denies burn approval. Actual acreage burned would be submitted to the county upon completion of each days burning.

Burn piles with larger materials would be cured for a minimum of 90 days. Smaller sized material would cure for 30 to 45 days to reduce the duration of smoke emissions. For prescribed burning, there would be no ignition within 25 feet of the edge of intermittent and ephemeral streams, and special aquatic features. For perennial streams, no ignition within 100 feet of the edge of the streams would occur. This restriction does not apply to draws and swales. Fire lines within Riparian Conservation Areas (RCAs) would be constructed with hand tools only and would be rehabilitated after prescribed fire operations are completed and includes construction of water bars and raking of fine organic material over bare mineral soil. Water bar construction would be installed based on the following chart:

Percent Slope	Feet
1-6	250
7-9	150

10-14	125
15-20	60
21-40	30
Greater than 40	15

For skid trails and firelines terminating at roads or OHV trails, two additional cross ditches would be required; one cross ditch at 30 feet from the intersection on all slopes and a second cross ditch 100 feet from the intersection for slopes less than 10 percent and 60 feet for slopes greater than 10 percent.

Depending on the current weather, fuel loading, and smoke conditions, one or more prescribed fire treatments may be required to achieve the desired fuel loading.

Post-harvest machine piling and burning of existing and operations slash would occur as necessary to reduce surface fuels in preparation for the reintroduction of prescribed fire. Pile burning would be conducted by Forest Service crews and would occur the first fall following piling in which burn prescriptions are met. Fire would be allowed to creep between piles and into RCAs during burning. Follow up prescribed burning would occur approximately 2-7 years after the pile burning is completed.

In preparation for prescribed fire, perimeter line construction would be needed where roads, trails, skid trails or natural barriers are absent. This may involve hand cutting of vegetation including trees up to 6-inch diameter, pruning, and scraping a bare soil line, or where consistent with other design criteria, line construction with a D-6 or smaller dozer. Fire lines within Riparian Conservation Areas (RCAs) would be constructed with hand tools only and rehabilitated after burning by construction of cross ditches and the raking of fine organic material over bare mineral soil. Location and rehabilitation of firelines would be approved by the project hydrologist or aquatic biologist. Additionally, upon completion of burning, all fire control lines within view of roads open to the public would be naturalized after completion of project work to discourage motor vehicle travel off of designated routes.

Due to considerable variability in vegetation types, ages of plantation trees, brush density, and existing surface fuels, the prescribed burn plan would incorporate various ignition techniques to prevent mortality of younger or thinner barked species.

To prepare the plantations for prescribed fire, it may be necessary to cut brush and trees (up to 8.9 inches d.b.h.), followed by piling and pile burning before prescribed burning activities are initiated; and, in some instances, only lopping and scattering small trees and brush would be necessary. Acceptable mortality in plantations would be less than 30 percent. If burning conditions are such that mortality would be expected to exceed 30 percent, firelines would be cut around the plantations in order to exclude them from the prescribed burn. All trees and brush killed by prescribed burning activities shall be left in place for wildlife purposes. Maintain 70% soil cover in plantations

Snags, Down Logs and Hazard Trees

Standing dead trees (snags) over 16 inches d.b.h. that do not present a hazard for woods worker and public safety would be retained to provide for sufficient snag numbers.

The removal of dead and unstable live trees (hazard trees) of all sizes would occur along utility lines, system roads and landings for woods worker and public safety throughout project implementation except where Riparian Conservation Area (RCAs) restrictions for removal apply. Designation of hazard or "danger" trees would follow direction in the *Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region* (Report Number RO-12-01, 2012). Hazard trees within the RCAs

would be felled toward the stream and left in place below roads to provide for additional down wood in RCAs.

Large woody material requirements would meet standards (SNFPA, 2004) for down log retention. Where possible, these large down logs (logs greater than 10 feet long and 16 inches in diameter at mid-point) would be left in place to the extent practical in treatment units, and would be protected during mechanical treatment activities and during understory prescribed burning.

Botany

Pleasant Valley Mariposa lily (*Calochortus clavatus* var. *avius*) populations within the project area and would be flagged for avoidance. All ground disturbing activities, burn piles, hazard tree removal, roadside brushing, mechanical equipment and line construction would be excluded from sensitive plant protection areas. If new sensitive plant occurrences are discovered during project implementation the project botanist would be notified to develop necessary protection measures.

Hand thinning and prescribed fire within sensitive plant protection areas may occur at the direction of the project botanist. The project botanist would be notified prior to implementation of the prescribed burn in sensitive plant habitat and if available would be onsite to take part in, and/or monitor burning and associated effects. At a minimum, a post burn visit would be conducted by the botanist.

Spring burning would not occur in Pleasant Valley Mariposa occurrences.

Prescribed burn units: Due to the fact that prescribed burn implementation could occur several years after completion of thinning or other treatments, the project leader or burn boss would notify the project botanist prior to line construction in order to re-flag occurrences. This would clarify occurrence boundaries and ensure that fire lines are not cut through occurrences.

Post-treatment monitoring of sensitive plants, noxious weed, and special habitat within the project area would be conducted following project implementation to ensure that the design criteria are effective.

Lava caps, which support unique plant communities in the project area, would be protected from motorized equipment and vehicles. Line construction through lava cap communities would be avoided when feasible. If necessary, line construction would be completed with hand tools only.

Known occurrences of Pacific yew would be identified by the project botanist prior to mechanical thinning and prescribed fire ignitions. Thinning and direct ignition would avoid areas with Pacific yew.

Priority 1 and 2 infestation within the project area would be flagged for avoidance and treated as a part of the Trestle project.

All vehicles and off-road equipment vehicles would be cleaned to insure it is free of soil, seeds, vegetative matter or other debris before entering National Forest System lands to prevent the introduction or spread of invasive plants. Prior to the start of operations, the Forest Service would do a visual inspection for such debris. Equipment would be cleaned prior to moving from weed-infested areas to weed-free areas.

All earth-moving equipment, gravel, fill or other materials would be weed free. Onsite sand, gravel, rock, or organic matter would be used where possible.

Mechanical treatments of weed-free units would be scheduled before weed-infested units.

Straw or mulch used for erosion control would be certified weed-free. A certificate from the county of origin stating the material was inspected is required.

Any seed used for restoration or erosion control would be from a locally collected source (ENF, Seed, Mulch and Fertilizer Prescription, 2000).

Hydrology and Aquatic Features

Table XXX. Equipment exclusion zones features for aquatic features of the Trestle Forest Health Project.[1,2,3,4]

Aquatic Feature	Ground-based equipment exclusion zone (feet)[1]			
	< 15 % slope	15 – 25 % slope	25 – 35 % slope	> 35 % slope
Perennial stream	75	100	150	Requires approval from a resource specialist after an on-site visit.
Intermittent stream	50	50	75	
Ephemeral stream	25	25	50	
Draw	10	25	25	
Special aquatic feature (springs, wetlands, meadows, etc.)	75	100	150	

[1] The equipment exclusion zones in Table 5 are intend to: 1) allow for fuel reduction activities near the majority of the aquatic features in the project area, which in turn reduces the risk of a high-severity wildfire in and near these features, 2) limit the amount of ground disturbance immediately adjacent to these aquatic features, which in turn minimizes the amount of sediment delivered to these features as a result of the TFHP, 3) protect areas where the slope of the ground is steep, such as in inner gorges, where the risk of slope failures is often high and the removal of vegetation and/or ground disturbance greatly increases this risk, and 4) maintain the diversity and cover of riparian vegetation adjacent to aquatic features, while maintaining coarse woody debris in riparian zones and large woody debris in stream channels.

[2] For streams, distances are as measured from the edge of the channel or riparian vegetation, whichever is greater.

[3] For draws, distances are as measured from the bottom of the draw. Draws have a poorly defined channel, and generally do not show evidence of recent flow.

[4] For special aquatic features, distances are as measured from edge of wet area or riparian vegetation, whichever is greater, Special aquatic features includes lakes, ponds, meadows, wetlands, springs, seeps, etc.

Table XX Design features for Aquatic Features and Riparian Conservation Areas (RCAs) of the Trestle Forest Health Project.[1,2,3,4,5,6]

Watershed or Unit(s) or Aquatic Feature(s)	Design Features	Rationale for Design Features
Riparian Conservation Areas (RCAs) in all Units	Entire RCA ▪ Ground cover would. be maintained at 70 percent or greater where the ground cover is currently 70 percent or greater. ▪ Approval by a Hydrologist, Fisheries Biologist, or Soil Scientist is needed for: a) construction of new landings and/or modification and use of existing landings, b) construction of permanent and/or temporary roads, c) use of ground-based equipment and/or removal of vegetation in inner gorges.. ▪ Approval by a Hydrologist or Fisheries Biologist is needed for equipment crossings of perennial and intermittent streams or the placement of temporary stream crossing structures. ▪ Felling and removal of hazard trees next to haul routes is allowed, with the following restrictions: a) hazard trees with commercial value that can be reached with skidding equipment would be targeted for removal - there would. be no endlining to remove trees, b) should a felled hazard tree enter a stream course, the Sale Administrator and Resource Specialist would determine the fate of the tree (e.g. repositioning of the tree, leaving a portion of the tree as felled, etc.), c.) hazard trees with no commercial	▪ Allows for fuel reduction activities near the majority of the aquatic features in the project area, which in turn reduces the risk of a high-severity wildfire in and near these features. ▪ Limits the amount of

Watershed or Unit(s) or Aquatic Feature(s)	Design Features	Rationale for Design Features
	value and those outside the reach of skidding equipment would be retained in place provided the felled trees would not interfere with the safe use of the road or adversely affect a stream course and associated culverts. ▪ No fire ignition within or immediately adjacent to riparian vegetation, unless otherwise specified for a certain type of aquatic feature. Equipment Exclusion Zones. ▪ Reach-in to remove non-riparian vegetation (typically 25 feet) is allowed (but not required) from the edge of the equipment exclusion zone. ▪ No end-lining of trees out of equipment exclusion zones. ▪ Construction of handlines for fire is allowed. Rehabilitation of the handlines would include waterbars and maintain at least 70 percent ground cover. Stream channels ▪ Removal of non-riparian vegetation (living or dead) is by hand is allowed up to the edge of the channel so long as the vegetation is not embedded into or growing out of the ground or channel. ▪ No removal of woody debris within stream channels or embedded in streambanks. ▪ No removal of vegetation (living or dead) within the stream channel or on streambanks. ▪ No hand treatments within 25 feet of the edge of perennial stream channels or within riparian vegetation, whichever is greater. ▪ No hand treatments within 10 feet of the edge of intermittent stream channels or within riparian vegetation, whichever is greater. ▪ Ignition of fire would not occur within 25 feet of the edge of the channel of perennial streams and special aquatic features or 25 feet from the edge of riparian vegetation, whichever is greater. Ignition would be limited to non-riparian vegetation. ▪ Ignition of fire would not occur within 10 feet of the edge of the channel of intermittent streams and ephemeral streams or within 10 feet of riparian vegetation, whichever is greater. ▪ For ephemeral streams, ignition of fire would not occur adjacent to the channel according to the following slope classes adjacent to the stream: less than 35% slope = 10 ft. no ignition, 35-70 percent slope = 50 ft. no ignition, and greater than 70 percent = 75 ft. no ignition. ▪ No burn piles would be placed within ignition exclusion zones or within 25 feet of any stream channel, whichever is greater.	ground disturbance immediately adjacent to these aquatic features, which in turn minimizes the amount of sediment delivered to these features as a result of the TFHP. ▪ Protects inner gorges, where the risk of slope failures is often high and the removal of vegetation and/or ground disturbance greatly increases this risk. ▪ Maintains the diversity and cover of riparian vegetation adjacent to aquatic features, while maintaining coarse woody debris in riparian zones and large woody debris in stream channels.
Unit 623473	▪ 10 ft. equipment exclusion zone for ephemeral streams and draws in Unit. ▪ For the intermittent stream in the eastern edge of unit, same equipment exclusion zones as described in Table 5.	Allows for the removal of high fuels buildup near these streams. Private land and buildings are nearby.
Unit 623474	10 ft. equipment exclusion zone for ephemeral streams and draws in the Unit.	Allows for the removal of high fuels buildup near these streams. The slopes adjacent to these streams are less than 15 percent.
Unit 623415	10 ft. equipment exclusion zone for ephemeral streams and draws in the Unit.	
Unit 622100	Equipment exclusion zones for streams are the same as described in Table 5 for perennial streams.	Lack of ground cover and other erosional issues next to stream merits the wider equipment exclusion zones for perennial streams.

[1] The design features in Tables 5 and 6 apply to thinning units and plantations. The design features are the same for Alternatives 2, 3 and 4 of the TFHP.
[2] Riparian Conservation Areas (RCAs) are 300 feet on each side of perennial streams and 150 feet on each side of intermittent and ephemeral streams (SNFPAROD 2004).
[3] Protection measures can be altered on-the-ground for a specific site by a Resource Specialist (Soil Scientist, Fisheries Biologist, Botanist, Hydrologist).
[4] Draws have poorly defined channels or no visible channel.
[5] Inner gorges are defined as areas with slopes greater than 70 percent adjacent to aquatic features.
[6] Riparian vegetation is defined as any native plant community composed of species which primarily occur where surface water or a shallow water table are accessible during the summer months and fall. Common, easily recognized riparian species include creek dogwood (Cornus sericea), white alder (Alnus rhombifolia), indian rhubarb (Darmera peltata), chain fern (Woodwardia fimbriata), wild ginger (Asarum lemmonii), columbine (Aquilegia formosa), and common monkey flower (Mimulus guttatus). Non-desirable vegetation targeted for herbicide use generally consists of upland woody brush species such as deer brush (*Ceanothus integerrimus*), whitethorn (*Ceanothus cuneatus*), manzanita (Arctostaphylos sp), bearclover (*Chamaebatia foliosa*), and bitter cherry (*Prunus emarginata*). A complete list of common riparian plants in California can be found in: *Common Riparian Plants of California, a field guide for the Layman* (Faber and Holland).

Wildlife

A limited operating period (LOP) for California spotted owls from March 1 through August 15 would restrict project activities for units that are located within ¼ mile of spotted owl activity centers, unless field surveys confirm that owls are not nesting. LOPs are subject to change as applicable based on new information.

A limited operating period (LOP) for northern goshawks from February 15 through September 15, would restrict project activities unless field surveys confirm that owls are not nesting. LOPs are subject to change as applicable based on new information.

A limited operation period (LOP) for great grey owls from March 1 through August 15, inclusive, would restrict project activities unless field surveys confirm that owls are not nesting. LOPs are subject to change as applicable based on new information.

Prescribed burn units that come within ¼ mile of PACs (in event activity cent changed) would. need surveys in future years to determine if LOPs are required.

LOPs for spotted owl, great grey owl, and northern goshawks would be implemented for road reconstruction (or portions of roads) activities which occur within ¼ mile of roost or nest stands.

Soils

The following Best Management Practices (BMPs) would be applied to project activities: 1-3, 1-5, 1-6, 1-9, 1-10, 1-11, 1-12, 1-13, 1-14, 1-15, 1-16, 1-17, 1-18, 1-20, 1-21, 1-22, 1-25, 5-2, 5-3, 5-5, 5-6, 7-1, and 7-3.

To control the surface erosion, activities would maintain a minimum soil cover of 70% in units with potentially moderate or higher erosion risk and include: 623 – 400, 403, 407, 408, 414, 416, 422, 436, 439, 440, 441, 442, 450, 456, 457, 458, 459, 460, 463, 465, 470, 471, 475, 624-572, and all Riparian Conservation Areas. All other units, minimum of 50% cover.

Following prescribed burning operations average soil cover for each treated unit would be maintained at 70% or greater one year following burning activities. If soil cover does not meet threshold values specified above after treatment, implement mitigation methods such as leaving weed free mulch would be applied to the affected site until vegetation re-growth could provide cover.

Activities would not increase unacceptable soil conditions above 15 percent in the activity area. Units 322-084, 085, 086, 087, 623-404, 405, 449, 465 and 471 were identified as above or near 15% extent for soil compaction. The primary skid trails and landings on these units would be ripped with shanks to alleviate soil compaction and erosion problems, restore infiltration, and discourage unauthorized OHV

use. Water-barring would occur following ripping. Minimum waterbar spacing consistent with Regional guidelines would be applied.

If excess soil displacement occurs during mechanical operations, skid trails would be re-contoured where possible and covered with slash or other organic material to a minimum of 70 percent cover at the conclusion of thinning activities.

No activities would occur on shallow soils without consultation with the Soil Scientist.

Cultural Resources

Cultural resource sites within the project area boundary would be protected from ground disturbance associated with mechanical and hand treatments during all phases of implementation activities of this project. No mechanical equipment would be allowed to operate within the boundaries of an identified cultural site. Where it is necessary to remove trees from within site boundaries, the District Archaeologist would be consulted to mitigate impacts. All thinning of trees adjacent to site boundaries would be directionally felled away from the site. The sites in units or near road maintenance/reconstruction would be identified with flagging and avoided during project activities. Sites that are flammable would be avoided during prescribed understory burning and fire line construction activities. Construction of firelines would occur outside of the cultural resource site boundaries. Gaps created would avoid cultural resource site locations. All machine and hand piles would be placed away from sites at a distance such that site features would not be affected by flames and heat. Hazard tree removal on or in the vicinity of cultural resource sites would be coordinated with the District Archaeologist and would follow the guidelines for hazard tree removal included in the Sierra Programmatic Agreement.

Should any previously unrecorded cultural resources be encountered during implementation of this project, all work shall immediately cease in that area and the District Archaeologist would be notified immediately. Work may resume subsequent to approval by the District Archaeologist and implementation of additional protection measures as necessary. Should any cultural resources become damaged in unanticipated ways by activities proposed in this project, the steps described in the *Programmatic Agreement among the U.S.D.A Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Officer Regarding the Identification, Evaluation and Treatment of Historic Properties Managed by the National Forest of the Sierra Nevada, California dated 1996 (SPA*) for inadvertent effects would be followed.

Water Quality and Soils

Implementation, effectiveness and forensic monitoring of the project would occur as defined in the Central Valley Timber Harvest Waiver Eldorado National Forest Monitoring Plan.

Monitoring

Monitoring after fuels treatments would follow LRMP guidelines. Effectiveness of fuels treatments would be evaluated using techniques such as photo points, post treatment fuel inventory, transects for soil coverage, or site inspection by the appropriate resource specialist the year following treatment.